Tuning of the β=0.62 Triple Spoke Cavity
September 04, 2004
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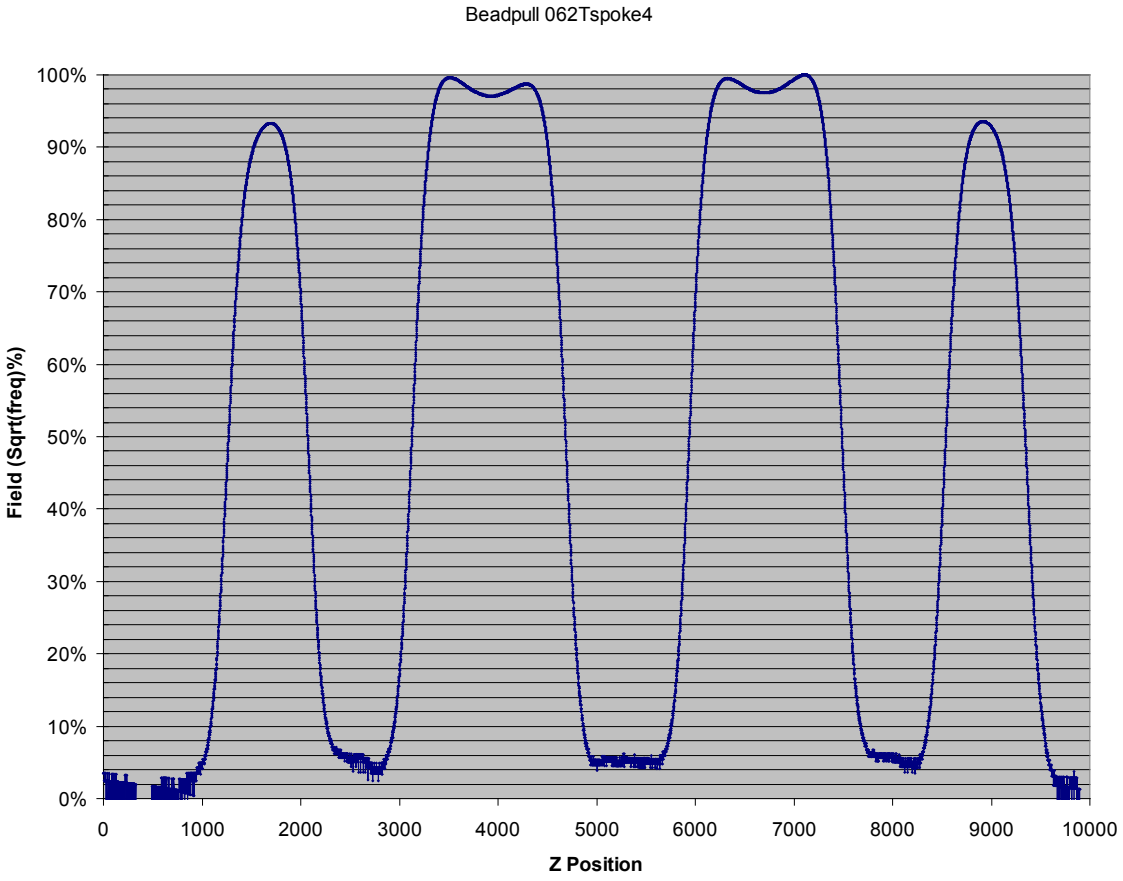
We have completed tuning of the first β=0.62 triple spoke cavity. Tuning was accomplished by trimming the end wall flanges to reduce the end gaps, reducing the frequency and boosting the end gap fields. A series of three tuning cuts were made. Four sets of measurement data were taken, one prior to any tuning and one upon completion of each tuning cut. A set of measurement data consisted of a frequency measurement using a network analyzer and a beadpull using the standard method. After tuning the cavity was within 9 kHz of it's target frequency, however the end gap fields were 6-7% lower than the mid gap fields.

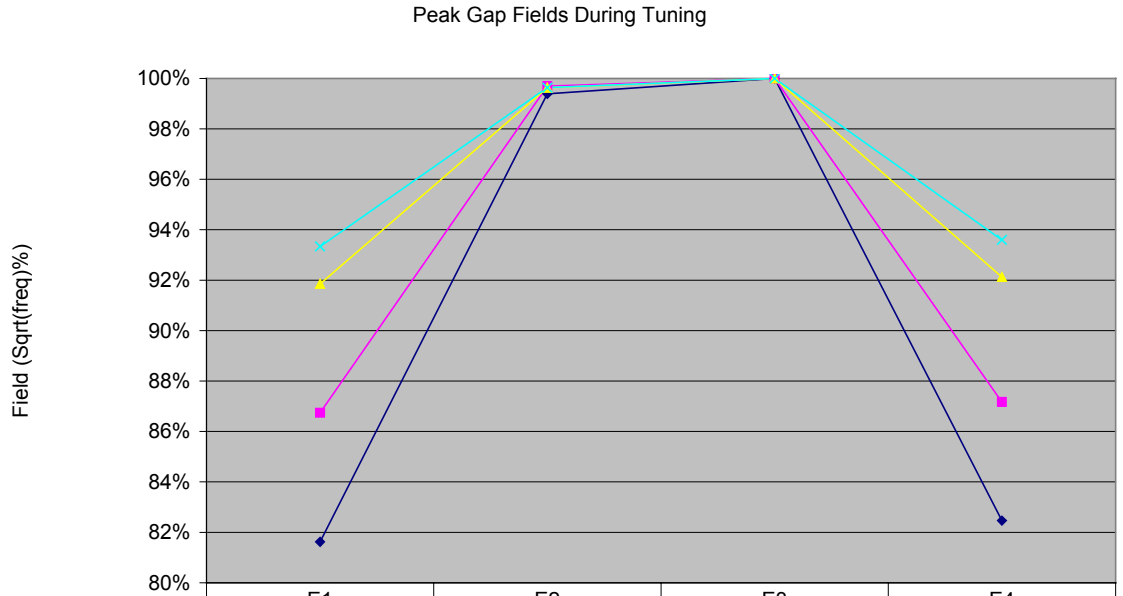
The table blow summarizes all of the measurement results including measured frequency, tune cut amounts, gap fields (at the peak in the gap and in % of the overall maximum). The target frequency is calculated by taking the desired operating frequency and adjusting it for the following:

1) Cooldown from 293.18K (20C) to 4K
2) Electropolishing
3) Weld Shrinkage
4) The thickness of indium seals used during tuning
5) Actual Measurement temperature and dielectric properties of the air.

Measurement Set	Initial	Tune 1	Tune 2	Tune 3
Measurement Date	10-Sep	10-Sep	10-Sep	13-Sep
End 1 Tuning Cut (mm)	-	3.81	3.81	1.22
End 2 Tuning Cut (mm)	-	3.81	3.81	1.22
Measured Frequency (MHz)	345.523	345.199	344.868	344.761
Target Frequency (MHz)	344.755	344.753	344.754	344.752
Frequency delta to Tune (MHz)	-0.768	-0.446	-0.114	-0.009
Beadpull File	***062Tspoke1***	***062Tspoke2***	***062Tspoke3***	***062Tspoke4***
E1	81.6%	86.7%	91.9%	93.3%
E2	99.4%	99.7%	99.6%	99.6%
E3	100.0%	100.0%	100.0%	100.0%
E4	82.5%	87.2%	92.1%	93.6%
dF (MHz)		-0.324	-0.331	-0.107
dF/dZ total (MHz/mm)		-0.0425	-0.0434	-0.0439
dE1 (%absolute)		5.1%	5.1%	1.5%
dE2 (%absolute)		0.3%	-0.1%	0.0%
dE3 (%absolute)		0.0%	0.0%	0.0%
dE4 (%absolute)		4.7%	5.0%	1.5%

On the following page is a plot of the final bead pull data along with a plot of how the gap peak fields changed as the tuning progressed. All the details measurements and calculations are given in the spreadsheet **Beta 062 Triple Spoke Tuning.xls**.





	E1	E2	E3	E4
062Tspoke1	81.6%	99.4%	100.0%	82.5%
062Tspoke2	86.7%	99.7%	100.0%	87.2%
062Tspoke3	91.9%	99.6%	100.0%	92.1%
062Tspoke4	93.3%	99.6%	100.0%	93.6%